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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/050,797

01/18/2002

Kazuichi Isaka

111697

9586

25944

7590

04/18/2006

OLIFF & BERRIDGE, PLC

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EXAMINER

NAFF, DAVID M

ART UNIT

PAPER NUMBER

1651

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/050,797	ISAKA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	David M. Naff	1651	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9, 11, 15, 19 and 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9, 11, 15, 19 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/15/06</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

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#### DETAILED ACTION

An amendment filed 1/18/06 amended the specification, and did not amend the claims.

Claims examined on the merits are 9, 11, 15, 19 and 25, which are all claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Claim Rejections - 35 USC § 103***

Claims 9, 11, 15, 19 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sumino et al (6,576,451 B1) in view of Gutttag (3,860,490).

The claims are drawn to a method of producing a microorganism-immobilized carrier for removing an exogenous endocrine-disrupting chemical in water by mixing microorganism with a hydrophilic prepolymer containing a hydrophilic group and a hydrophobic prepolymer containing a hydrophobic group in an amount of 1-40% of the total weight of hydrophilic and hydrophobic prepolymer, and polymerizing. Also claimed is the resultant microorganism-immobilized carrier (claims 11), and methods (claims 15 and 19) of removing an exogenous endocrine-disrupting chemical in water.

Sumino et al disclose mixing a microorganism with an oligomer and polymerizing the oligomer to form a gel that

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inclusively entraps the microorganism (col 3, lines 17-20, col 5, lines 56-61 and col 8, line 2). The gel containing the entrapped microorganism is used in decomposing endocrine disrupter related compounds (col 1, lines 54-60) such as bisphenol A (paragraph bridging cols 7 and 8, and col 8, lines 35-43). The gel containing the microorganism is put in a reaction vessel (col 9, line 15 and col 10, line 31), and waste water containing an endocrine disrupter related compound is contacted with the gel. The oligomer contains a main structure with polymeric double bonds at both ends, and a sub-structure arranged between the main structure and the polymeric double bonds containing a urethane bond and an ethyleneoxy, or a urethane bond and an ethyleneoxy and a propyleneoxy (col 2, lines 16-23). The urethane bond has hydrophobicity and results in a gel that is flexible and has increased strength and erosion resistance (col 4, lines 37-43). The main structure is composed of a polyalkylene glycol that is a block copolymer formed by copolymerizing a hydrophilic ethyleneoxy monomer with a hydrophobic propyleneoxy monomer (col 4, lines 25-30). The ratio of propyleneoxy is smaller than that of ethyleneoxy (col 4, lines 54-56). The ethyleneoxy has affinity for the microorganism (col 4, lines 15-17). Sumino et al also disclose a comparative example (col 9, lines 60-64) using a conventional

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ethyleneoxy oligomer which is a derivative of polyethylene glycol containing an acryloyl group or a metacryloyl group on each end.

Gutttag disclose immobilizing a microorganism by polymerizing a mixture containing monomers and the microorganism (col 5, lines 50-60). Monomers present may be hydrophilic monomers (paragraph bridging cols 2 and 3) and monomers which are hydrophobic (col 3, lines 34-36) to produce a copolymer containing the microorganism entrapped therein.

When carrying out the comparative example of Sumino et al, it would have been obvious to co-polymerize the polyethylene glycol derivative which is hydrophilic with a polypropylene glycol derivative containing an acryloyl group or a metacryloyl group on each end which is hydrophobic to prevent the microorganism from decomposing a gel made of only the polyethylene glycol derivative as suggested by Sumino et al disclosing forming a block copolymer of hydrophilic ethyleneoxy and hydrophobic propyleneoxy to prevent the microorganism from decomposing the gel when only ethyleneoxy is present (col 4, lines 15-22), and as suggested by Gutttag disclosing polymerizing a mixture containing a hydrophilic monomer, a hydrophobic monomer and a microorganism to produce a copolymer entrapping a microorganism. Omitting the urethane bond disclosed by Sumino

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et al would have been obvious for reasons set forth above. Since Sumino et al suggest that the amount of propylenoxy should be less than the amount of ethyleneoxy (col 4, lines 54-56), it would have been obvious to use an amount of hydrophobic pre-polymer within the range of claim 9. Sumino et al use the entrapped microorganism from the comparative example in the same way as the entrapped microorganism from polymerizing the oligomer of the invention, and when carrying out the modification set forth above, it would have been obvious to use the entrapped microorganism to remove an exogenous endocrine-disrupting chemical from water as in present claims 15 and 19.

***Response to Arguments***

Applicant's arguments filed 1/18/06 have been fully considered but they are not persuasive.

Applicants urge that the present invention resulted from a joint research agreement between Hitachi Plant Engineering & Construction Co. and Shin-Nakamura Chemical Co., and because of this agreement under 35 USC 103(c)(2), Sumino et al is not a reference due to being commonly owned with the present invention. However, the statement of 7/29/05 contains no evidence to support the assertion of the agreement, and the statement does not contain a date of the agreement. The date of 5/31/2000 asserted in the specification has been deleted by

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amendment. Moreover, there is no evidence to support this date. A statement of a joint research agreement should be in declaration form containing evidence of the agreement and date of the agreement, and that the agreement resulted in the claimed invention.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

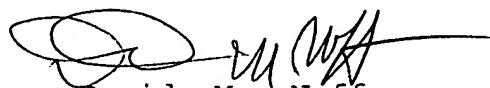
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David M. Naff  
Primary Examiner  
Art Unit 1651

DMN

4/17/06